

The background of the entire cover is a dark, textured surface with a bokeh effect. Numerous out-of-focus circles in shades of teal, blue, and white are scattered across the frame, creating a sense of depth and movement.

NICHOLAS A.  
ASHFORD

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CHARLES C.  
CALDART

# ENVIRONMENTAL LAW, POLICY, AND ECONOMICS

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RECLAIMING THE ENVIRONMENTAL AGENDA

## **Environmental Law, Policy, and Economics**

Reclaiming the Environmental Agenda

Nicholas A. Ashford and Charles C. Caldart

*Environmental Law, Policy, and Economics* offers a detailed discussion of the important issues in environmental law, policy, and economics, tracing their development over the past few decades through an examination of environmental law cases and commentaries by leading scholars. The book treats the traditional topics covered in most classes in environmental law and policy, including common law and administrative law concepts and the primary federal legislation. But it goes beyond these to address topics not often found in a single volume: the information-based obligations of industry, enforcement of environmental law, market-based and voluntary alternatives to traditional regulation, risk assessment, environmental economics, and technological innovation and diffusion.

"Ashford and Caldart have produced an extraordinary book sweeping across the scientific complexity, legal underpinnings, economic logic, and policy challenges of environmental protection. With its encyclopedic range and valuable detailed analyses of the core statutes addressing air and water pollution, waste, and chemical exposures as well as other issues, this book offers an indispensable foundation for those seeking to understand society's approach to environmental challenges."

—Daniel C. Esty, Hillhouse Professor of Environmental Law & Policy, Yale Law School

"An excellent, provocative book by two leading scholars that challenges much of the accepted wisdom that has guided public policy. Agree or not, it is thoughtful 'must reading' for everyone who is serious about environmental law and policy."

—E. Donald Elliott, former General Counsel, U.S. EPA, and Adjunct Professor of Law, Yale and Georgetown Law Schools

"For teachers, students, and active citizens, this comprehensive text clearly and superbly covers the complex subjects of environmental pollution, law, policy, and economics over a broad and dynamic reality. A virtuoso achievement by two seasoned scholars and practitioners."

—Ralph Nader

"At a time when the world is rethinking environmental policy, this book provides a tremendous resource for academics, policymakers, and the environmental community. The work presents a rich multi-disciplinary perspective on historical approaches and offers alternative innovative solutions to environmental and public health

protection. It is the textbook we have always needed."

—Thomas A. Burke, Director, Johns Hopkins University Risk Sciences and Public Policy Institute

"This book provides a comprehensive introduction, a thorough assessment, and a needed resource for anyone interested in reducing environmental pollution. It provides a useful framework for preventing harm, transforming our technologies, and increasing business innovations with an excellent presentation of theories of pollution in social, economic, and legal context, and the shortcomings of prevailing regulatory and enforcement approaches. This book arrives just in time as our federal regulatory system is in critical need of repair. It is likely to become the bible for activists, academics, or any change agent."

—Gary D. Bass, Executive Director, OMB Watch

"This treatise offers an engaging text for the serious student of public policy who wants to understand environmental policy design from a technical, legal, and economic perspective. The analysis offers a penetratingly critical review of current policies and how we developed them, insightfully analyzing what works and what does not. Focused on chemical hazards, pollution, and industrial organization, the book addresses the fragmented, media-specific statutes with a fresh, innovation-driven technology approach that presents a positive, integrated, and solution-oriented vision for the next wave of policy development."

—Ken Geiser, Director, University of Massachusetts, Lowell, Center for Sustainable Production

"Radical reformation of industrial production must become a much higher priority to avoid human and environmental catastrophes in an age of global terrorism and commerce. The authors lay out the philosophical and policy underpinnings that support the cutting-edge synthesis of inherent safety and pollution prevention. If the new paradigm is embraced, the health of workers, communities, businesses, and the environment will be sustained."

—Jerry Poje, former board member of the U.S. Chemical Safety and Hazard Investigation Board

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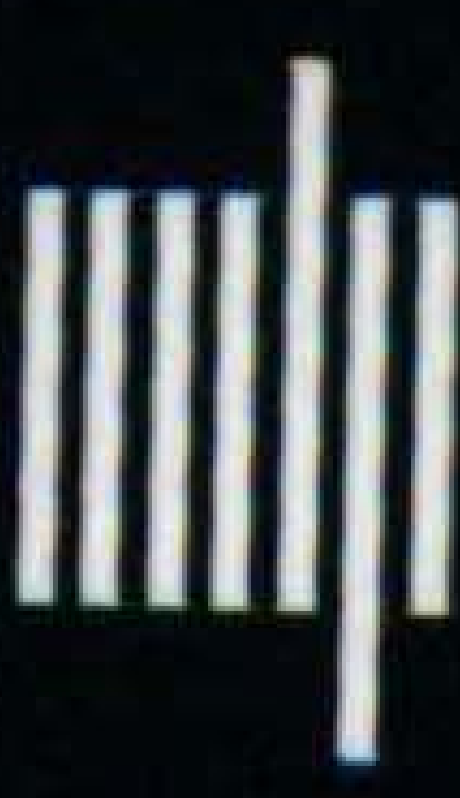
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# ENVIRONMENTAL LAW POLICY, AND ECONOMICS

ASHFORD AND CALDART



# **Environmental Law, Policy, and Economics**

## **Reclaiming the Environmental Agenda**

**Nicholas A. Ashford**  
**Charles C. Caldart**

**The MIT Press**  
**Cambridge, Massachusetts**  
**London, England**

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# Environmental Law, Policy, and Economics

### **Praise for *Environmental Law, Policy, and Economics***

“The inclusion of environmental science in the context of a treatise on environmental law, policy, and economics makes this book one of the most comprehensive, useful, and timeless treatments on the subject to date.”

—Jennifer Sass, Senior Scientist, Natural Resources Defense Council

“This book is a timely and important contribution, written by authors who combine decades of academic excellence with significant real life experiences. It demonstrates the cutting edge potential for law to become a policy tool that can drive sustainable innovation when applied by knowledgeable and capable practitioners. The vast and comprehensive scope is both broad and deep; the synthesis of complex interconnections is a welcome tour de force.”

—Ted Smith, Founder and former Executive Director, Silicon Valley Toxics Coalition and Coordinator, International Campaign for Responsible Technology

“This book explores not only the basic environmental pollution control laws but also, and of fundamental importance, the ways in which these laws do or do not lead to cleaner production. Its explanations of various concepts and legal tools will be useful to both students and practitioners.”

—John C. Dernbach, Professor of Law, Widener University Law School

“A comprehensive and invaluable compendium of two decades of scholarship and jurisprudence on the legal, social, and economic dimensions of pollution regulation, control, and prevention. Written largely from an American perspective, the volume draws important lessons from the comparative, European experience, as well.”

—David A. Sonnenfeld, Professor and Chair, Department of Environmental Studies, SUNY College of Environmental Science and Forestry

“Highly recommended for use both in the classroom and the law office. It is not only a highly useful treatise on the field, but a convincing affirmation of the central role law plays in environmental protection.”

—William Futrell, President, Sustainable Development Law Associates

Dedicated to the committed government employees, activists, scholars, and far-sighted firms who have helped protect the environment and public health.



## Foreword

As a country, we have made substantial progress in cleaning up the environment, thanks to an ambitious statutory framework, impressive contributions by states, municipalities, and the private sector, and most importantly by the American public's unwavering support for clean air and water. And yet, we face a daunting array of challenges. The environment continues to be degraded by toxic chemicals such as pesticides, heavy metals, and synthetic organic compounds. We continue to lose wetlands, wildlife habitat, and other productive natural resources to development. Demand has exploded for clean water for all its many purposes, in some places outstripping available supplies, as population and economic activity increase. We are notoriously inefficient in the way we use both water and energy. Numerous fisheries are excessively harvested or depleted, and coastal estuaries and waterways are degraded by runoff from sources of pollution dispersed across the landscape. Most obvious today is the threat of global climate change; as more greenhouse gases are pumped into the atmosphere, leading scientists report we may have reached, or be close to reaching, a "tipping point" that requires urgent action.

What is clear from this sampling of environmental concerns is that, notwithstanding the progress we have made, we have not yet fulfilled the promise of a clean, healthy environment for all Americans envisioned when President Nixon created the Environmental Protection Agency in 1970.

Is it time to rethink the roles and strategies of government and the private sector in safeguarding public health and the environment? Taking the twin pillars of regulation and enforcement as a foundation, tackling the challenges of global climate change and toxic pollution requires more of us to fashion nonpartisan solutions that enlist the creativity and entrepreneurial spirit of Americans. Technology, which has contributed to past problems, must be employed to reverse current energy and pollution trends, as they pose a clear risk to all of us. This requires the intelligent use of legal and economic tools to create appropriate incentives for those engaged in industry, agriculture, transportation, and business—as well as for consumers, and citizens generally—for we have learned over more than 30 years in this endeavor that

environmental protection is by no means the exclusive province of EPA. Rather, we have to build the concern into all aspects of our economic and community life if we are to achieve a safe, healthy environment.

We need far more attention devoted to the means by which we can stimulate and deploy new, more environmentally sustainable technologies. We need to harness market forces on behalf of the environment. More and more companies are learning that improving efficiency and cutting waste pays off—in their bottom line. Ultimately, we need to reconcile consumer demand with the growing awareness of its impacts on a finite and, it seems, increasingly vulnerable planet.

*Environmental Law, Policy, and Economics* provides a valuable foundation for constructing multifaceted approaches to nonpartisan environmentalism. It offers, in one place, grounding in environmental science, economics, law, and policy. The authors examine the relative effectiveness of law and economics, including the emergence of information, or right-to-know, tools for addressing environmental challenges and spurring technological advancement. The book's subtitle, *Reclaiming the Environmental Agenda*, could well be its title. My hope is that this work will help provide the basis for renewing our commitment to environmental health in step with a modern industrial society. Our future may well depend on our ability to embrace a paradigm shift to sustainable development, in other words, to a model of economic prosperity that respects the essential contribution of the natural systems on which all human activities depend.

William K. Reilly  
Administrator,  
Environmental Protection Agency, 1989–1993

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## Introduction

This text on environmental law, policy, and economics grows out of courses taught by the authors at the Massachusetts Institute of Technology over the past 25 years. During that period, there has been a significant evolution in environmental policy. New environmental legislation has been added at the federal level, and older environmental legislation has been substantially reshaped by congressional amendments. There has also been a significant evolution in environmental science, and in the treatment of science (and scientific uncertainty) by the courts.

The concept of the cost-benefit analysis as an overriding normative principle has gained a firm foothold in both congressional and judicial thought, and it does periodic battle with the equally powerful notion that “technology forcing” is a legitimate function of environmental law. Increased citizen participation—in both legal and political processes—has been a focus of federal environmental legislation, and this has borne considerable fruit at the federal, state, and local levels. Yet, despite increased public involvement in environmental policy (or perhaps because of it), environmental law is under attack in several quarters.

Traditional (so-called command-and-control) legislative approaches are alleged to be increasingly ineffective and fragmented, and many argue that mandatory styles of governance should give way to—or at least be heavily influenced by—negotiated stakeholder processes. So-called end-of-pipe approaches for pollution control are now less favored than preventing pollution at the source, but analysts disagree as to whether regulations or economic incentives provide a more effective pathway to this end. Some argue that the polluting industry itself is in the best position to come up with the appropriate solutions, and that incentives should be structured accordingly, while others argue that many incumbent industries and products ought to be replaced with more sustainable ones. Finally, there appears to be an increased willingness in the federal courts to second guess (albeit often implicitly) the policy choices made by Congress, which makes environmental law more unpredictable than it would otherwise be.

One of the authors (NAA) brings to this treatise both a knowledge of, and involvement in, European approaches to environmental challenges and a long history of inter-country comparative research on the effects of regulation on technological change. The other author (CCC) brings years of experience in litigating violations of environmental statutes and regulations, and in the creative use of the law to protect citizens, workers, and consumers.

This work includes what might be found in a traditional course in environmental law and policy: common law and administrative law concepts; the standard air, water, and waste statutes; the Pollution Prevention Act; the National Environmental Policy Act; and the Endangered Species Act. We also include a chapter on enforcement. Beyond these more traditional topics, we also address the information-based obligations of industry (such as “right-to-know” laws), and the problems presented by sudden and accidental chemical releases of chemicals (which require different approaches from those focused on the gradual release of pollution). In addition, we include chapters on environmental economics and market-based and voluntary alternatives to traditional regulation. Finally, because we believe that an appreciation of the basics of environmental science and risk assessment, and a familiarity with the processes of technological innovation and diffusion, are essential complements to the understanding of legal concepts, we explore these topics as well.

The text focuses on pollution rather than energy, and addresses both pollution control and pollution prevention (what the Europeans call cleaner and inherently safer production). Perhaps the most distinguishing characteristic of the volume is its emphasis on the evaluation, design, and use of the law to stimulate technological change and industrial transformation, rather than to merely control pollution. We argue that the law can be used to implement an “industrial policy for the environment” and that beyond changes in industrial inputs, products, and processes, there is a need to address broader issues of sustainable development, which will involve the shift from products to product services, and further to larger system changes.

As the subtitle of the text—*Reclaiming the Environmental Agenda*—implies, we depart from those environmental law, environmental policy, and environmental economics texts that argue for a reduced role for government. The environmental record of the past 35 years suggests there is much to be gained when government provides clear, stringent legal requirements for environmental improvements and for technological transformations, although these requirements must be coupled both with flexible means to achieve environmental targets and with meaningful stakeholder participation.

The text is meant to provide a broad and detailed discussion of the most current pressing issues in environmental law, policy, and economics for the general reader, and to provide in one volume material for undergraduate and graduate-level courses taught in law, business, and public policy schools; schools of public health; and in

departments of urban studies, civil and environmental engineering, environmental sciences, chemical engineering, chemistry, and economics. There is more material in this text than would ordinarily be taught in one semester. The material could easily span a two-semester—or two- or three-quarter—sequence of courses. Because of the broad expanse of the materials and their stand-alone nature, the instructor teaching a one-semester or one-quarter course could easily select only some of the regulatory systems—for example air and water pollution or waste—coupled with the tutorials on right to know and/or pollution prevention and/or tort and/or science and/or economics.

Because of the lengthy nature of this treatise, we have included very little statutory material in the text itself. The reader is encouraged to read selected statutory language provided at the website: [http://mitpress.mit.edu/ashford\\_environmental\\_law](http://mitpress.mit.edu/ashford_environmental_law). That website will also contain updated material considered essential for keeping abreast of the developing environmental law and policy, such as new cases and commentary.

